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(54) Abstract Title
A modular towel rail

(57) A radiator for installation in a central heating system is disclosed and comprises a plurality of pipes (12,13) and releasable push-fit coupling members (10,11) connecting each pipe (12,13) together to form a frame, each push-fit coupling (10,11) comprising at least two sockets (15,16) each having a pipe (12,13) received therein, and sealing means (19) interposed between each socket (15,16) and the pipe (12,13) to prevent egress of fluid from the frame via the coupling members (10,11).

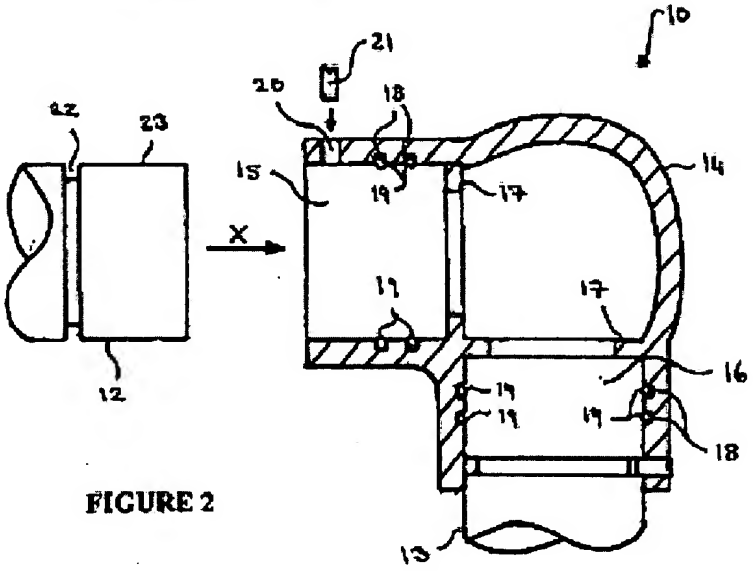

FIGURE 2

GB 2 365 114 A

A Radiator

The present invention relates to a radiator generally of the type installed in water filled central heating systems. More specifically, it relates to a towel warmer formed from a framework of interconnected pipes that are often fitted in bathrooms so that the bathroom can be heated and/or towels can be hung on the pipes to warm and dry them.

A example of a conventional radiator in the form of a towel warmer 1 is illustrated in Figure 1 and comprises five horizontally oriented pipes 2 vertically spaced from each other by connecting pipe sections 3. The topmost horizontally oriented pipe 2a is joined at right angles at each end to a connecting pipe section 3 via a right angle coupling 4. The remaining horizontally oriented pipes 2b to 2e are each joined at right angles at each end to two co-axial connecting pipe sections via a double right angle coupling 5. The resulting configuration of pipes forms the framework shown in Figure 1 through which hot water from a boiler may be passed via an inlet 6 and outlet 7 to heat a room in which the radiator is fitted and towels or clothes hung on the pipes 2. The temperature of the pipes may be controlled using a valve 8 to adjust the flow of water through the framework. The radiator may be attached to a wall via the flanges 9 extending laterally from two of the couplings 4.

To connect the horizontal and connecting pipes 2,3 during manufacture of the radiator, and to ensure that there are no leaks, the end of each pipe 2,3 is welded to the coupling 4,5 to form a single integral sealed radiator unit. The join is then polished.

A problem a conventional radiator of the type described above is that it is time consuming and labour intensive to manufacture. Furthermore, it is often desirable to give the radiator an attractive finish by plating it with chrome or other metal. However, it is difficult to do this until after the radiator has been assembled as the subsequent welding step would damage the plated surface. This means that a plating bath or tank larger than the size of an assembled radiator is required to enable the whole radiator to be immersed during the plating process. In addition, if

one of the horizontally oriented pipes or connecting pipes is damaged or dented during transport to the consumer or during use, the whole radiator must be replaced at substantial expense.

It is desirable to provide a radiator that overcomes or alleviates the aforementioned disadvantages.

According to the present invention, there is provided a radiator for installation in a central heating system comprising a plurality of pipes and a plurality of push-fit coupling members each comprising at least two sockets releasably connecting the pipes together with the end of each pipe being received in a socket, and sealing means interposed between each socket and its respective pipe to prevent egress of fluid from the radiator.

In a preferred embodiment, the sealing means comprises O-ring seals.

The socket preferably includes a circumferential recess, the O-ring seals being disposed in the recess.

Preferably, the sealing means comprises a pair of O-ring seals, each seal being disposed in a circumferential recess in the socket.

In one embodiment, the recesses are parallel and spaced from each other.

The O-ring seal is conveniently made of rubber.

Preferably, the socket includes fastening means releasably retaining each pipe in its respective socket.

Conveniently, the fastening means comprises a threaded through hole in the socket and a screw threadingly engaged in the hole and tightened against the pipe.

In one preferred embodiment, each pipe has a circumferential groove in its outer surface and the fastening means comprises a threaded through hole in the socket and a screw threadingly engaged in the hole such that it extends into the groove in the pipe to retain the pipe in the socket.

There is also provided a method of assembling a radiator according to the invention, the method including the step of inserting the end of each pipe into a socket on each push-fit coupling member to thereby connect the pipes together.

Preferably, the method includes the step of fastening the end of each pipe in its respective socket using the fastening means.

Embodiments of the invention will now be described, by way of example only, with reference to Figures 2 and 3 of the accompanying drawings, in which :-

Figure 1 illustrates a prior art radiator;

Figure 2 illustrates a cross-section view of a right angle coupling member used in the radiator of the present invention; and

Figure 3 illustrates a double right angle coupling member used in the radiator of the present invention.

Referring now to the drawings, there is shown in Figures 2 and 3 two coupling members 10,11which replace the coupling members 4, 5 shown in the conventional radiator of Figure 1. It will be appreciated that from the outside, the assembled radiator using the coupling members of the invention will generally have the same appearance as the conventional radiator illustrated in Figure 1.

The coupling member 10 shown in Figure 2 is a single right angle coupling for connecting two pipes 12,13 at right angles to each other to enable fluid flow between them. The coupling member 10 comprises a body 14 having a pair of sockets 15,16. Each socket 15,16 has an end wall 17, a pair of circumferential recesses 18 each containing a rubber O-ring 19 and a radially oriented threaded through hole 20 in the wall of the socket to receive a grub screw 21.

The pipes 12,13 each have a circumferential groove 22 adjacent to their ends for reasons that will become apparent from the following description.

To attach a pipe 12 to the coupling member 10, it is pushed into the socket 15 in the direction shown by arrow X in Figure 2. As the socket has only a fractionally larger diameter than the pipe 12, it is a sliding fit in the socket 15. The pipe 12 is inserted into the socket 15 so that it contacts the end wall 17 and cannot be inserted further. As the pipe 12 is inserted, O-rings 19 engage the outer surface 23 of the pipe and form a seal between the pipe and the socket 15 to prevent the egress of fluid therefrom. Pipe 13 is shown fully inserted in socket 16.

When the pipe 12,13 has been fully inserted into the socket 15,16, the groove 22 in the pipe 12,13 is located in line with the radial hole 20. To prevent removal of the pipe 12,13 from the sockets 15,16 a grub screw 21 is screwed into the hole 20 so that it extends into the groove 22 formed in the pipe 12,13. Inadvertent removal of the pipe 12,13 from the socket 15,16 is thereby prevented. If the radiator is to be disassembled to, for example, replace a damaged pipe, the grub screw 21 can be easily removed and the pipe 12,13 pulled out of the socket 15,16 using manual force.

The pipe coupling 11, shown in Figure 3, is identical to the pipe coupling shown in Figure 2 except that it has an additional socket 24 for connecting the ends of three pipes 12,13, 25 together to enable fluid flow between all three pipes, two pipes 12,25 being co-axial and the remaining pipe 13 extending at right angles from pipes 12,25.

The coupling members 10,11 of the present invention are designed so that the pipes 12,13,25 will not be forced out of the sockets 15,16,24 due to the pressure of the fluid within the pipes 12,13,25. The coupling members have been tested to a pressure of 7 bar. This is more than adequate for a conventional central heating system which generally operates at a pressure of less than 3 bar.

It will be appreciated from the foregoing that the radiator of the present invention can be sold in kit form for assembly by the consumer. This makes it much cheaper to produce. Furthermore each component can be plated and polished separately so a large plating tank is no longer required. A damaged pipe can also be replaced easily. The coupling members and pipes are made from the same material such as aluminium, stainless steel or brass.

The invention has been described with reference to a radiator with ball shape coupling members. However, it will be appreciated that the coupling members of the invention can be flatter.

Many modifications and variations of the invention falling within the terms of the appended claims will be apparent to those skilled in the art and the foregoing description should be regarded as a description of the preferred embodiments only.

Claims

1. A radiator for installation in a central heating system comprising a plurality of pipes and a plurality of push-fit coupling members each comprising at least two sockets releasably connecting the pipes together with the end of each pipe being received in a socket, and sealing means interposed between each socket and its respective pipe to prevent egress of fluid from the radiator.

2. A radiator according to claim 1, wherein the sealing means comprises an O-ring seal.

3. A radiator according to claim 2, wherein the socket includes a circumferential recess, the O-ring seal being disposed in the recess.

4. A radiator according to claim 3, wherein the sealing means comprises a pair of O-ring seals, each seal being disposed in a circumferential recess in the socket.

5. A radiator according to claim 4, wherein the recesses are parallel and spaced from each other.

4. A radiator according to any of claims 2 to 5, wherein the O-ring seal is made of rubber.

5. A radiator according to any preceding claim wherein the socket includes fastening means releasably retaining each pipe in its respective socket.

6. A radiator according to claim 5, wherein the fastening means comprises a threaded through hole in the socket and a screw threadingly engaged in the hole and tightened against the pipe.

7. A radiator according to claim 5, wherein each pipe has a circumferential groove in its outer surface and the fastening means comprises a threaded through

hole in the socket and a screw threadingly engaged in the hole such that it extends into the groove in the pipe to retain the pipe in the socket.

8. A radiator according to claim 6 or claim 7, wherein the screw is a grub screw.

9. A radiator according to any preceding claim, wherein the sockets are oriented substantially at right angles to each other.

10. A method of assembling a radiator according to any preceding claim, including the step of inserting the end of each pipe into a socket on each push-fit coupling member thereby connecting the pipes together.

11. A method according to claim 9 wherein the method includes the step of fastening the end of each pipe in its respective socket using the fastening means.

12. A radiator substantially as hereinbefore described, with reference to the accompanying drawings.

13. A method of assembling a radiator substantially as hereinbefore described.

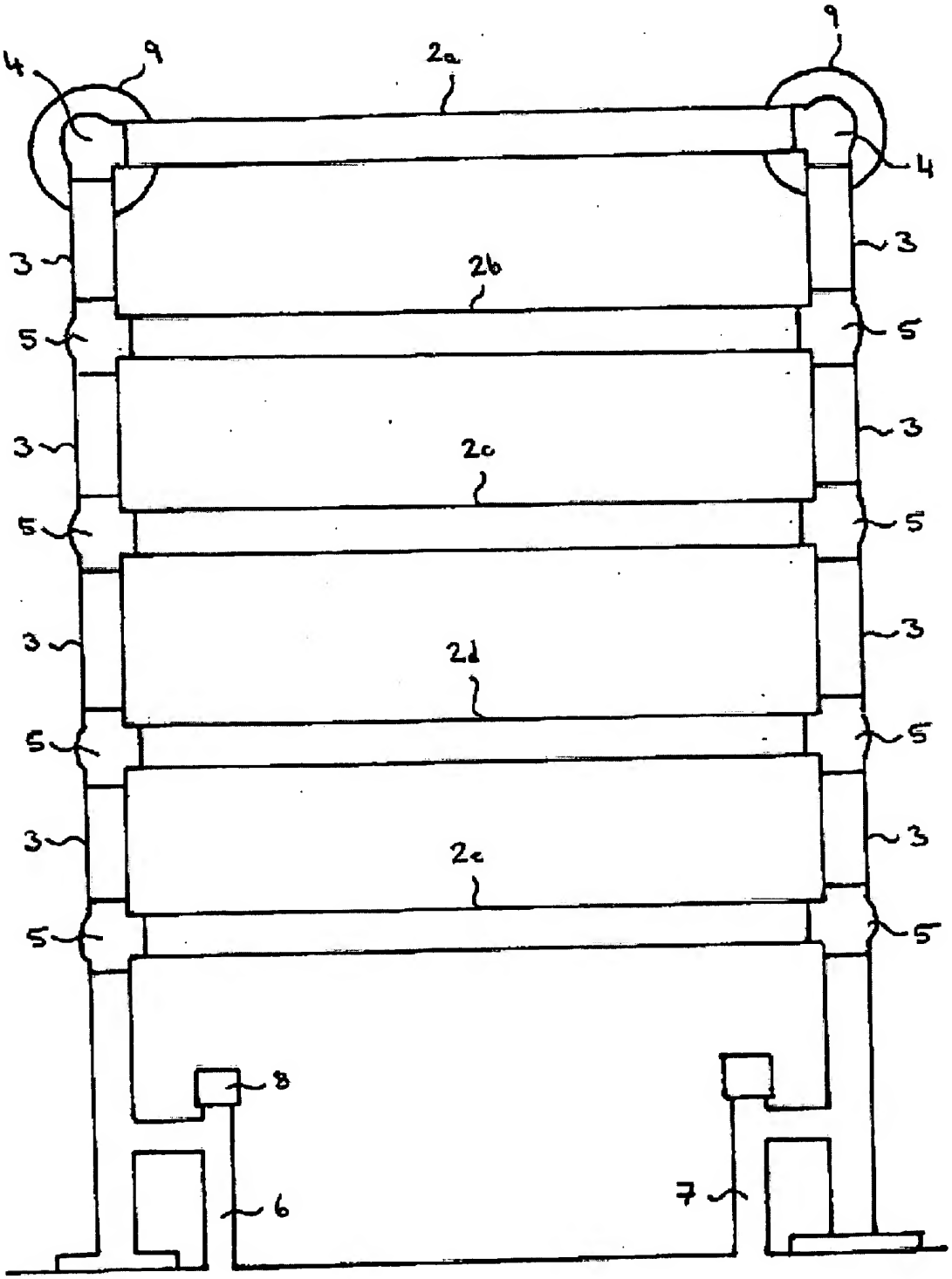

FIGURE 1

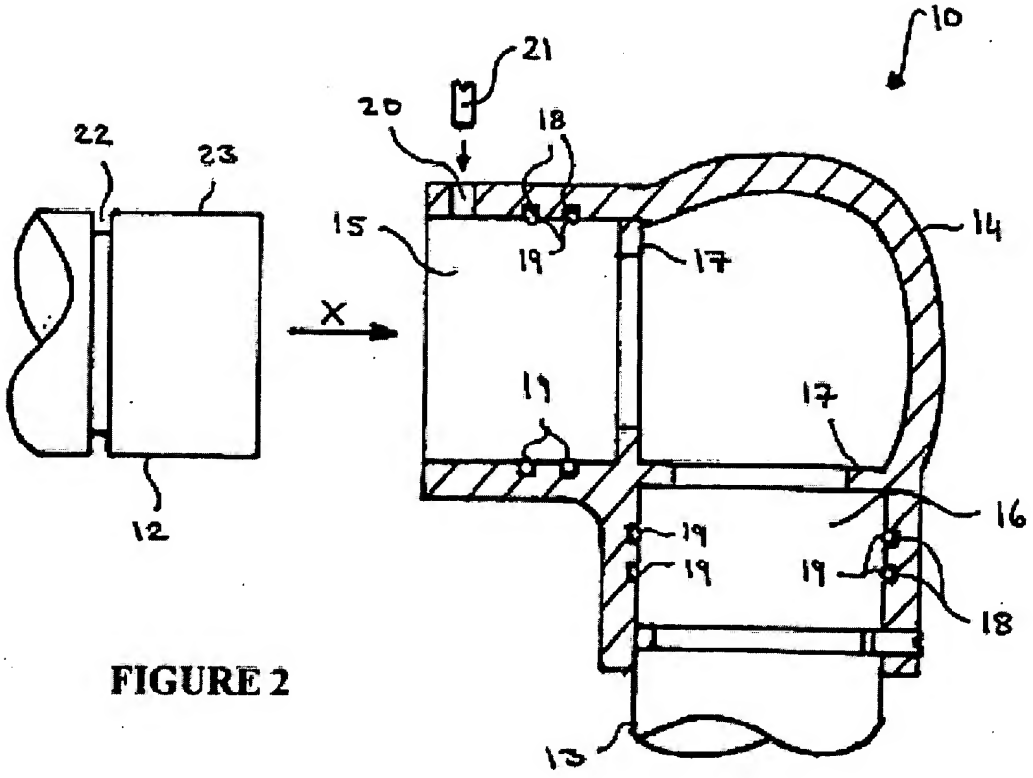

FIGURE 2

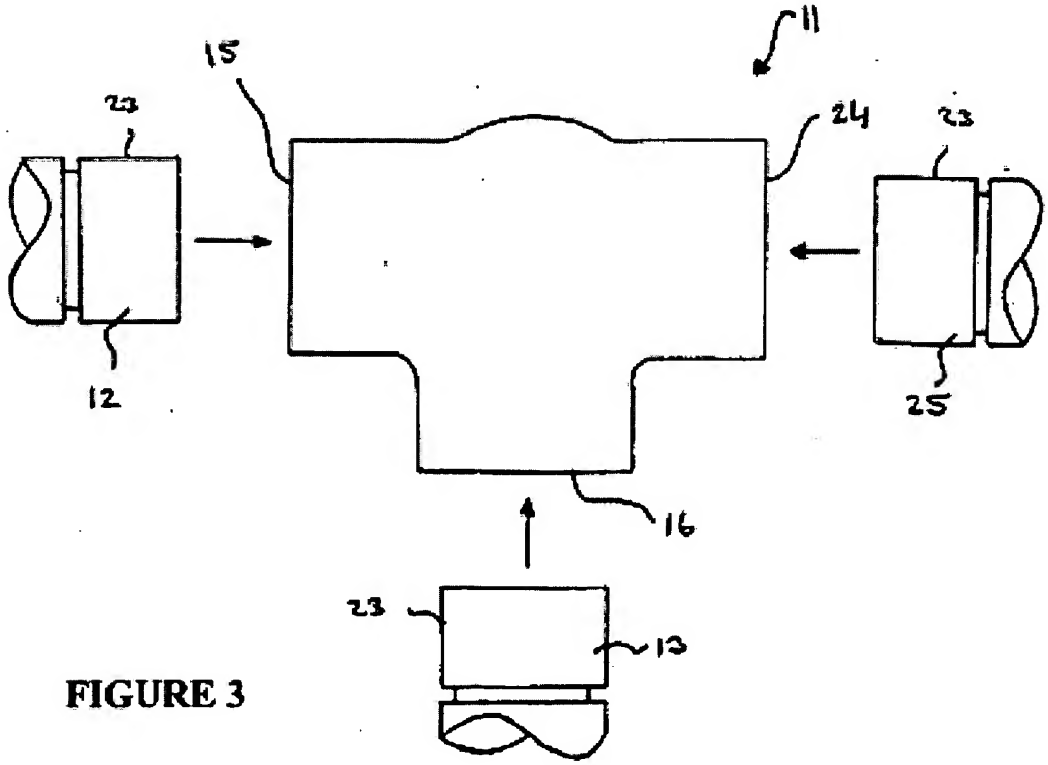

FIGURE 3